



ORTHOS LIDAR REMOTE SENSING ELEVATION MODELS CONTOURS INFRARED DATA CONVERSION ANALOG & DIGITAL MAPPING 3D MODELS GROUND BASED LASER MAPPING TRAINING



Total Geographic Solutions

# Sanborn - NAIP 2010 Summary

**Date:** December 7, 2010

**Location:** APFO

*Presented by: Steve Ashbee, Program Manager  
Jason Caldwell, Director of Strategic Accounts*



# Agenda



Sanborn Team & Resources  
Project Overview  
Factors Affecting Acquisition  
Lessons Learned  
Comments/Suggestions

## Sanborn team & Resources

- Colorado Springs & Charlotte production resources for processing
  - Sanborn owned resource flew 50% of exposure with subs flying other 50%
  - All data processing accomplished using Sanborn's IT infrastructure in Colorado Springs with human resources located in Sanborn's North Carolina and Colorado Springs offices.

# Sanborn Team & Resources

- Acquisition Resources

Resource Source	Aircraft Type	Engine	Camera Type
Sanborn	Aero Commander 680W	Turbine	DMC
Sanborn	Aero Commander 500s	Piston	DMC
Sanborn	Navajo	Piston	DMC
Sanborn	Navajo	Piston	DMC
Sanborn	Cessna 320	Piston	UltraCam
Sanborn	Navajo	Piston	UltraCam
Subcontractor A	Cessna 441 - Conquest	Turbine	UltraCam
Subcontractor B	Navajo	Piston	DMC
Subcontractor C	Navajo	Piston	DMC
Subcontractor D	Cessna 320	Piston	UltraCam
Subcontractor E	Cessna 320	Piston	UltraCam
Subcontractor F	Piper Malibu	Piston	UltraCam

# Project Overview

2010 State Project Map  
NORTH CAROLINA



County Boundary  
DOQQs  
MOA Areas  
Restricted Areas

Project Totals  
Number of Counties - 100  
Number of Photo Stations - 7,333  
Number of DOQQs - 3,581  
Square Miles - 54,382



2010 State Project Map  
CALIFORNIA



County Boundary  
DOQQs  
MOA Areas  
Restricted Areas

Project Totals  
Number of Counties - 68  
Number of Photo Stations - 22,412  
Number of DOQQs - 11,095  
Square Miles - 164,891



2010  
State Acquisition Periods  
CALIFORNIA



County Boundary  
Apr 15 - May 31 (Season 1)  
Jun 1 - Jun 30 (Season 2)  
Jun 21 - Jul 31 (Season 3)  
Jul 7 - Aug 7 (Season 4)

State	Total DOQQs	Total CCMs	Imagery Type	UTM Zones	Total Sq. Mi.
CA	11,095	58	RGB/NIR	10, 11	164,891
NC	3,581	100	RGB/NIR	17, 18	54,382
<b>Project Totals</b>	<b>14,676</b>	<b>158</b>			<b>219,273</b>

- Direct to digital image acquisition
- 1 meter pixel resolution, 4-band
- Absolute Horizontal Accuracy requirement of 6.0 m @ NSSDA defined 95% confidence

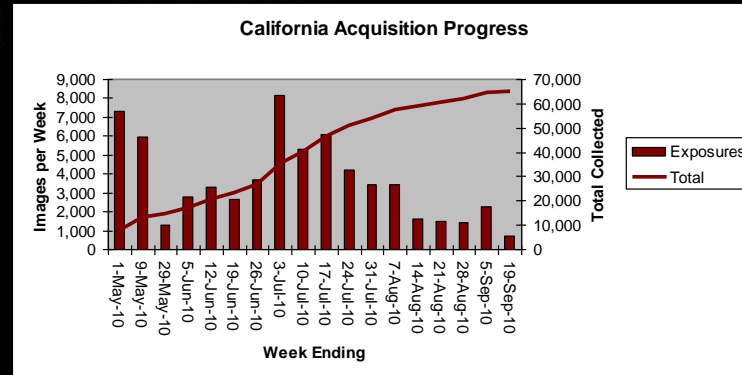
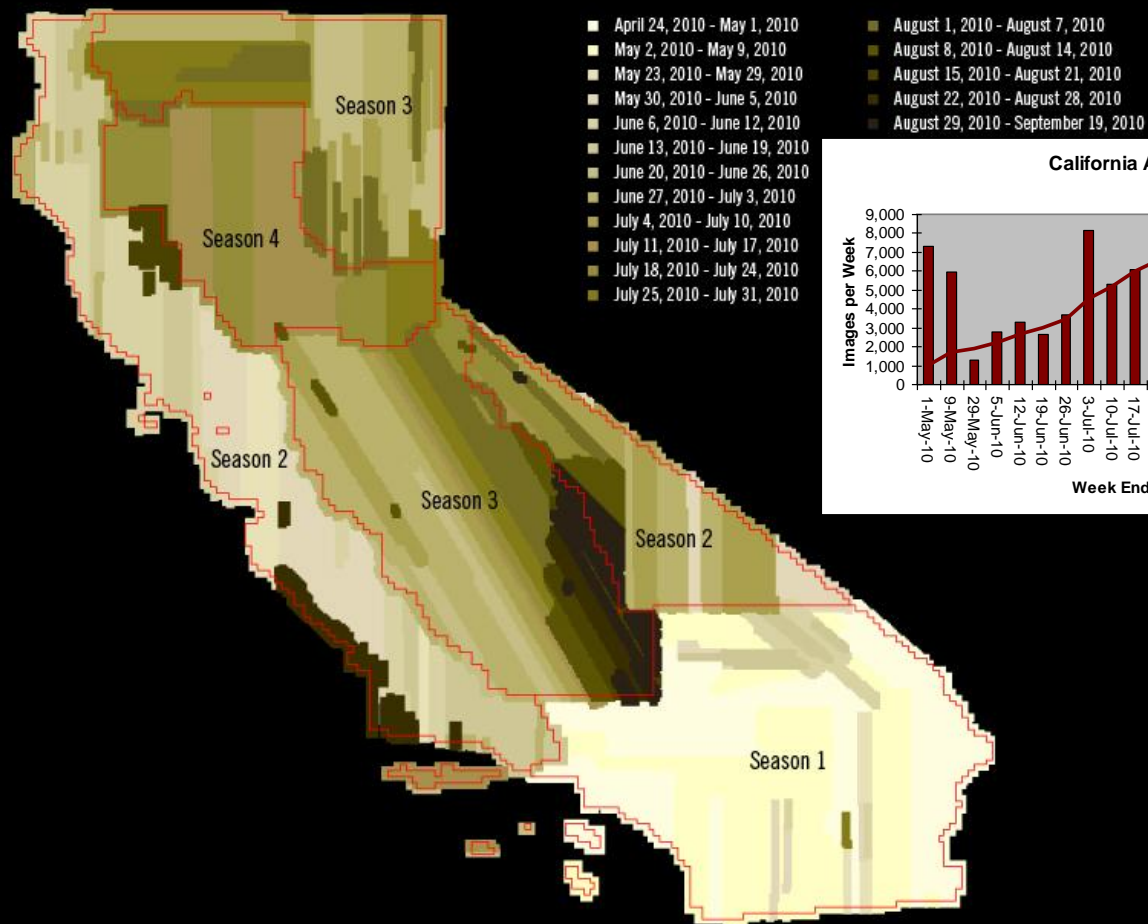
# Acquisition Review

California Acquisition Review				
State	Total Days Estimated	Total Days Actual	Total Exposures Estimated	Total Exposures Actual
California	115	158	45,024	65,072

California Acquisition Progress (extensions)			
Season	Total Days in Season	Actual Days season	Reason for Extensions
Season 1	46	4, two week extensions	Snow below tree line
Season 2	30	3, two week extensions	Snow below tree line, restricted airspace, coastal fog
Season 3	40	2, two week extensions	Restricted airspace combined with wild fire and smoke
Season 4	30	0	N/A



## 2010 NAIP California Orthoimagery Acquisition



## Capacity Analysis

State	Total Days	Total Days Actual	Total Exposures in Project Area	Total Exposures in Project Area
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North Carolina

92

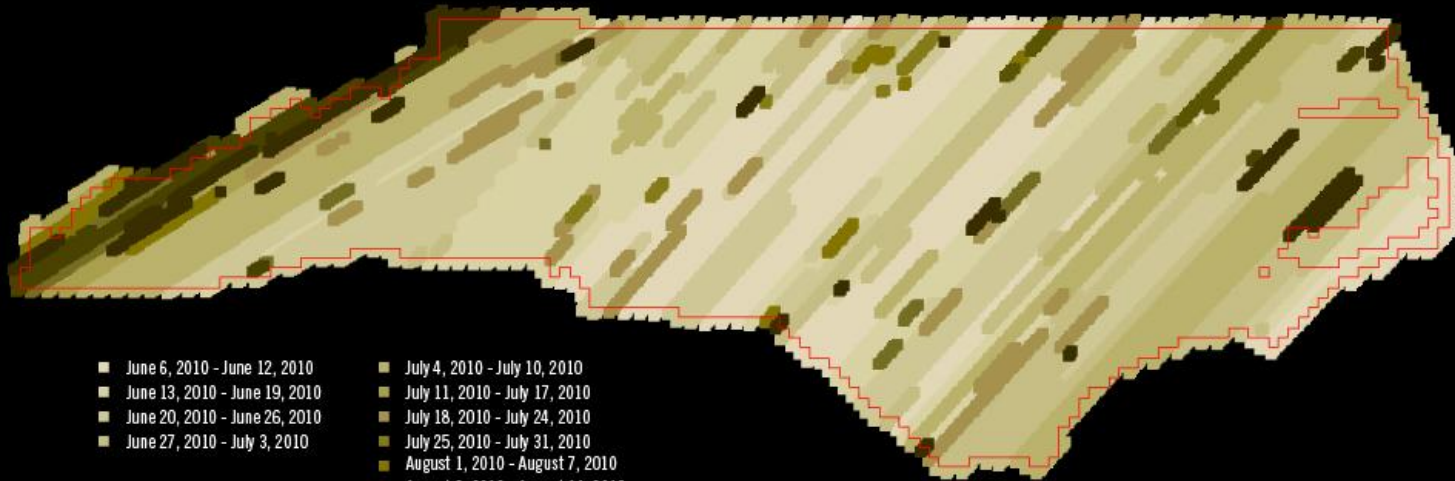
92

10,868

11,918

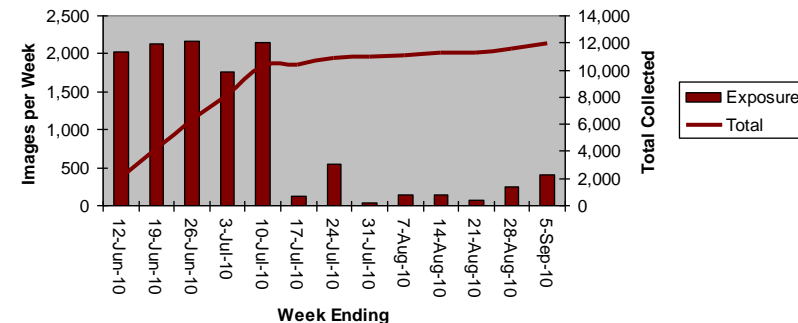
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## 2010 NAIP North Carolina Orthoimagery Acquisition Schedule



- June 6, 2010 - June 12, 2010
- June 13, 2010 - June 19, 2010
- June 20, 2010 - June 26, 2010
- June 27, 2010 - July 3, 2010
- July 4, 2010 - July 10, 2010
- July 11, 2010 - July 17, 2010
- July 18, 2010 - July 24, 2010
- July 25, 2010 - July 31, 2010
- August 1, 2010 - August 7, 2010
- August 8, 2010 - August 14, 2010
- August 15, 2010 - August 21, 2010
- August 22, 2010 - August 28, 2010
- August 29, 2010 - September 4, 2010

North Carolina Flight Progress





# Factors Affecting Acquisition



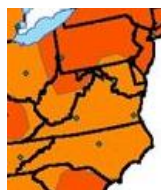
- Weather
  - Average clear days in North Carolina is low compared to other most States
  - 2010 late spring snow conditions unusually heavy in California
- Flight Restrictions
  - Limited access to MOAs. Often unsuitable conditions when provided access
  - ATC directives with respect to proximity of aircraft to one another

# Factors Affecting Acquisition



## Clear Air Days - June

Average Number of days per month with 10% or less cloud cover



## Clear Air Days - July

Average Number of days per month with 10% or less cloud cover



## Clear Air Days - August

Average Number of days per month with 10% or less cloud cover



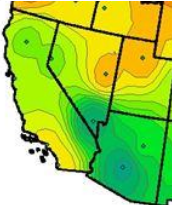
## Clear Air Days - April

Average Number of days per month with 10% or less cloud cover



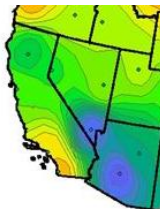
## Clear Air Days - May

Average Number of days per month with 10% or less cloud cover



## Clear Air Days - June

Average Number of days per month with 10% or less cloud cover



## Clear Air Days - July

Average Number of days per month with 10% or less cloud cover



## Clear Air Days - August

Average Number of days per month with 10% or less cloud cover



# Factors Affecting Acquisition



- Flight Restrictions
  - Pre-notification of flight generally had good results
  - NC restricted area collected relatively smoothly
  - Continued directives with respect to aircraft proximity. One called for acquisition platforms to be 80 miles from one another
  - ATC in CA sometimes denied access or interrupted potentially productive flight opportunities
  - Traffic around LA proved to be the challenge expected

# Factors Affecting Acquisition



- Flight Restrictions – Military Zones
  - NC – Several areas, mostly in the eastern portion
  - Allowed to fly when base was “cold”
  - Pre-notification and communication with security personnel helpful
  - CA - Size of MOA’s and limited access resulted in those areas taking more calendar time than the rest of the state.
  - Security requesting copies of imagery of some areas for review
  - Shapefile provided by military security used to identify raw images that might contain sensitive information



# Other Factors

- AGPS/IMU issues
- Breaking in some new flight subcontractors
- Peaks and valleys in data volume coming from acquisition
- CCM boundaries extending across Season boundaries
- Size of some CCMs



# Lessons Learned 2010 NAIP

- Subcontractor management
  - Applying only to acquisition simplified processing management
  - Flight subcontractors – dependability factor
  - Rely more on proven subs for volume
  - Have identified some good potential in a couple of the new subcontractors broken in this year
- Ensure flight plans for States broken by Season accommodate completed CCM's at perimeter
  - More overlap between flight plans
  - Planning some additional flight up-front will be offset by fewer re-flights
- Issues relating to direct geo-referencing
  - Some issues may be difficult to detect
  - Impact of EO errors exaserbated in high relief areas
  - AT required to correct
  - Impact to processing schedule
- Radiometry
  - Continued applying mean value as opposed to peak as in previous years with good results
  - Better control of results by processing all imagery using same process and software
- Workflow management
  - Process all imagery using the IT infrastructure in Colorado Springs
  - Maintain as much continuity as possible with personnel assignment to the program
  - Continue to train and augment resource capacity
  - Apply a smaller maximum size to CCM segments

# Going into 2011

- Continue to use Colorado Springs IT infrastructure for processing
  - Staff from all offices can log-in
  - Use project-dedicated servers on GB network
  - Charlotte staff more experienced using this approach and APS software
- A more proactive approach to control risk of IMU/GPS failures
  - Bore-site validations
  - Complete analysis of trouble areas
  - Ensure early detection process in place
- Apply subcontracting lessons learned
  - Proactive management, standardized reporting, highly specific delivery requirements
  - Maintain specific area assignments
  - More experienced proven subcontractors will get larger assignments
- Can provide image processing capacity of 35,000 to 45,000 DOQQs

# Comments/Suggestions

- Continue to document standard dividing lines for large CCM's that have to be segmented to fit on multiple DVD's.
  - Reducing target maximum size to 3.5 GB may help ensure continuity of dividing lines for segments
- Consider ending requirement for vendor supplied CCM's.
- Flight restricted areas: Develop a common database of information that all can access.